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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,992	09/25/2001	Peter Krummrich	112740-317	3291
29177	7590	11/03/2004	EXAMINER	
BELL, BOYD & LLOYD, LLC			SINGH, DALZID E	
P. O. BOX 1135			ART UNIT	PAPER NUMBER
CHICAGO, IL 60690-1135			2633	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/963,992

**Applicant(s)**

KRUMMRICH ET AL.

**Examiner**

Dalzid Singh

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chraplyvy et al (US Patent No. 5,225,922) in view of Ransford et al (US Patent No. 6,532,087).

Regarding claim 1, in Fig. 2, Chraplyvy et al discloses optical transmission system for equalizing channel quality differences in a WDM system having N transmitters (plurality of transmitter at terminal 18), N receivers (plurality of receivers at terminal 24) and N channels (plurality of N channels corresponding to the plurality of N transmitter), the method comprising the steps of:

measuring separately a bit error rate of each of the N channels in each of the N receivers, the bit error rates being respectively measured at different decider thresholds and phase angles, deviating from an optimum value, in N first decision circuits (in col. 3, lines 8-20 and col. 4, lines 4-15, Chraplyvy et al disclose measuring bit error rate (BER) of each channel; in col. 4, lines 19-31, Chraplyvy et al disclose detector of each channel, which provide information to the microprocessor, therefore, it would have been obvious that there exist N decision circuit corresponding to the N detectors to measure N optical channels; furthermore, Chraplyvy et al disclose measurement of bit error rate

and adjustment of power of each channel accordingly, therefore it would have been obvious that the bit error rate is measured and compared to different decider thresholds and phase angles in order to determined how much the signal is deviating from an optimum value).

calibrating the N transmitters via a control device by raising levels of the channels having a small Q value and lowering levels of the channels having a large Q value at a ratio of the respective Q value of the channel, an aggregate level of all N channels in the N transmitters being kept constant (in col. 4, lines 19-56 and col. 5, lines 6-44, Chraplyvy et al disclose adjusting the optical power of each channel by increasing or decreasing the power level based on the bit error rate or SNR; therefore since bit error rate can be used to calculate Q-value, it would have been obvious that the power adjustment is also related to the Q-value, see below); and

repeating all of the above steps until all N Q values of the N channels in the N receivers are equal (in col. 4, lines 60-68 to col. 5, lines 1-43, Chraplyvy et al disclose readjustment of the input signal).

Chraplyvy et al disclose optical transmission system as discussed above comprising of measuring bit error rate (BER) and differ from the claimed invention in that Chraplyvy et al do not specifically disclose determining a bit error rate at an optimum operating point by extrapolating the measured bit error rates for each of the N channels and determining a Q value for each of the N channels from the respectively associated extrapolated bit error rates. However, extrapolating bit error rate (BER) and determining Q-value is well known. Ransford et al is cited to show such well known

concept. In col. 3, lines 26-35 and col. 7, lines 42-51, Ransford et al disclose that BER is extrapolated and Q-value is determined. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to extrapolating the measured bit error rates for each of the N channels and determining a Q value for each of the N channels as taught by Ransford et al to the transmission system of Chraplyvy et al. One of ordinary skill in the art would have been motivated to do such in order to predict system performance and adjust necessary parameters and compensate error.

Regarding claim 2, as discussed above, Chraplyvy et al disclose that carrying out preemphasis, prior to the step of measuring, in which a level distribution in the N transmitters is changed such that OSNR values of the N channels are matched in the N receivers by measuring OSNR values in the N receivers and controlling the level distribution in the N transmitters via the control device (in col. 4, lines 19-56, Chraplyvy et al disclose adjustment of power at the transmitter based on the received bit error rate at the receiver; in col. 5, lines 6-43, Chraplyvy et al disclose that the BER is related to optical signal to noise ratio (OSNR)).

Regarding claim 3, as shown in Fig. 2, Chraplyvy et al show that level adjustment of the WDM system to equal Q values is carried out via external measuring equipment during installation (as shown in Fig. 2, the adjustment of optical power is performed by controller (56), which is an external measuring equipment).

Regarding claim 4, as discussed above, Chraplyvy et al disclose measuring the N Q values of the N channels in a second decision circuit, associated with the respective receiver, during operation of the WDM system (as discussed in rejection of

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claim 1, Chraplyvy et al disclose detectors of each channels providing information to the microprocessor; therefore it would have been obvious that there is a second decision circuit associated with second detector in order to determine if the optical channel is within a desired range).

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dugan et al (US Patent No. 5,923,450) is cited to show optical channel regulator and method.

Shimokawa et al (US Patent No. 6,445,471) is cited to show apparatus and method for making transmission characteristic uniform in WDM optical communication system.

Li et al (US Patent No. 6,697,577) is cited to show in service optimization of performance of optical transmission system.

Goodwin et al (US Patent No. 6,701,089) is cited to show over-equalization for multi-span WDM fiber optical communication systems.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272--3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS  
October 28, 2004

*Patricia Singh*